



Jake Bryant

We need to talk about climate

The Environmental Change Institute has had a profound influence on both governments and individuals, *Jamie Condliffe* discovers

Above: Filio Amezcuita, a Peruvian research student, measuring tree trunk respiration as part of pioneering long-term monitoring of carbon dynamics in Amazonian forests; the measurements contribute to a large multi-partner programme jointly led by the ECI, yielding insights into tree responses to the recent droughts and the two-way interaction between these immense tropical forest ecosystems and global atmospheric change

When it comes to environmental change, most people have an opinion. Few, however, have answers. But the University's Environmental Change Institute (ECI) has been trying to change that – a process that has not only involved complex natural and social science, but squaring up to the task of communicating research to the outside world, too. Twenty years on and the world's environmental problems are far from solved, but the ECI has helped inform government policy and increase public understanding.

'When the ECI was set up through benefaction in 1991, it was extremely innovative and ambitious,' explains Professor Andrew Goudie, who led the Institute's founding task force. 'It was designed to be problem-led and therefore interdisciplinary, running big research programmes across climate change, ecosystems and energy.' Those same research areas are just as important today, and so far some 300 research projects have been completed.

Much of the work has been carried out in collaboration with academics from across the University, working with the ECI to address the world's most pressing environmental problems. From fine-grained social studies in the UK to long-term monitoring in tropical forests and, most recently, the world's largest climate forecasting experiment, that variety is part of the reason the ECI has achieved such success in influencing national and international policy.

Take, for instance, the UK Climate Impacts Programme (UKCIP), funded by the government since 1997. The programme began by working with individual regions of the UK to assess the impact climate change might have. 'We worked with stakeholders around the country to help them understand how climate change could affect them and what they might want to do in response,' explains Dr Chris West, Director of UKCIP. As well as geographical regions, UKCIP works closely with service providers like the healthcare sector and utilities companies – a process designed to engage key decision-makers with the risks of climate change. Indeed, UKCIP's stakeholder-led approach is acknowledged worldwide as pioneering, and is regularly held up as a model for others.

If such a scheme was designed to raise awareness, then more recent work is capitalising upon it. Spearheaded by Professor Myles Allen, climateprediction.net is the world's biggest climate prediction experiment to date, jointly run by Oxford e-Research Centre's Volunteer Computing, the Department of Physics and the ECI. 'Our original experiments were focused on idealised physical science questions,' explains Professor Allen, 'but our latest stream of research, the Weather at Home experiment, sponsored by *The Guardian*, is focused on the immediate impacts of climate change and how it affects extreme weather.' To help share out the huge computational load, volunteers download software and

perform climate calculations on their PCs, before the results are sent back to Oxford electronically. 'It's proved to be one of our most successful projects to date,' says Professor Allen. So far, 350,000 people in 150 countries have joined climateprediction.net, a testament to the increasing awareness of environmental issues fostered by projects from within the University.

But it's not just the public who are increasingly aware of the importance of climate issues. A new breed of researchers are keen to use knowledge from their subject area to explore current environmental concerns – and there's no better example than Allen himself. 'Back in 2003 I wrote an article about the attribution of extreme weather events,' he explains. 'That was a tentative suggestion of what might be possible some day. Now, these applied questions about extreme examples of climate change are becoming more important.' As a result, his research emphasis has shifted from purely physical science questions to those concerned with the human impact on climate change. 'I'm happy to say that this kind of thinking is becoming mainstream across the entire research community,' he says.

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The ECI is also helping those with a similar outlook achieve their potential, thanks to the prestigious Masters course in Environmental Change and Management. Oversubscribed tenfold and taking students with backgrounds ranging from engineering through accountancy to international relations, the alumni list features some hugely influential environmental policy players. Students have gone on to assume positions such as Secretary of State for the Environment in Pakistan, the opposition spokesman for environment in South Africa, and the personal energy adviser to the President of the Maldives. Given the course is just 16 years old, there's no doubting that those ranks will grow.

As they do, the course's alumni will most likely be paying close attention to the work of the ECI because, while much of the Institute's research is published in prestigious scientific journals, plenty is explicitly targeted at influencing governmental policy. The ECI's ongoing research on domestic energy use is a perfect example. 'The ECI started on fuel poverty back in the 1990s,' says Dr Nick Eyre, leader of the ECI's Lower Carbon Futures programme, 'but we soon realised we needed a much better understanding of how energy was being used in the home.'

Research into domestic appliances enabled the ECI to advise European governments on the development of the rainbow-coloured energy efficiency stickers now used across all white goods. 'The knock-on effect was a gradual market transformation,' explains Dr Eyre. 'The labels encouraged people to buy the more efficient appliances in their price range, which in turn encouraged manufacturers to supply such models.' Government regulation was able to aggressively underpin these changes, and the result has been a huge increase in energy efficiency standards across Europe.

The ECI has also been keen to understand the bigger picture. ECI reports such as *40% House and Home Truths* have played a key role in convincing policy makers that major reductions in energy use and carbon emissions due to UK housing are possible. Now, following the UK government decision to cut emissions by 80% by 2050, the ECI is working out how this can be achieved. 'It's a massive challenge for everyone involved in refurbishing our homes, and we're looking at all the changes that might be needed to do that,' explains Dr Eyre. 'But we already know that it's primarily a "people challenge", getting

everyone from home owners to building firms and local communities to engage with these issues. That's where some of our more off-the-wall research is coming into play.'

In fact, the ECI is managing to raise public awareness with real innovation. In recent years the Institute has worked with the UK music industry to help it tackle its carbon footprint, and set up an initiative with Oxford United Football Club to drive interest in environmental change. ECI researchers have even been involved with the games company Red Redemption, lending expertise to help create a computer game, *Fate of the World*, which simulates the real social and environmental impact of global climate change. 'It was vital that we were based in Oxford and involved with the University during the project,' says Ian Roberts, Creative Director at Red Redemption. 'We needed to be immersed in the subject of climate change, and needed access to experts in the field. The ECI really helped us.' The game has proved to be both a critical and commercial success.

But there's still a way to go, because ECI staff believe communicating the threat of climate change isn't enough: people need to see solutions, believe they work and understand they can be part of them, too. That emphasis



Top: The Thames Barrier, London's main flood defence; the ECI has played a pioneering role in managing the risks associated with climate change. Bottom: 'Positive proof of global warming': knickers through the ages engage the public in climate change at Oxford Town Hall

upon solutions has helped spawn Pilio, the first spin-out company from Isis Innovation's Software Incubator, and the ECI's first commercial venture. It provides an online tool enabling small and medium-size businesses to monitor and manage their energy usage – and so far over 400 companies have used it.

With the Institute celebrating its 20th anniversary, and having grown in size to accommodate over 70 staff and 60 students, things continue to develop apace. The ECI's new director, Professor Jim Hall, is an engineer used to delivering innovative solutions to real-world environmental challenges like flooding, coastal erosion and water scarcity. Now the ECI is leading a multi-partner £5m national programme that aims to create strategies for delivering energy, transport and water in ways that future-proofs them against environmental change.

'We're seeing a change in who's involved in our research,' explains Professor Hall. 'A lot of the collaborators in this project are big businesses, working on some big strategic issues, which suggests that the challenge we've had in the past surrounding communication might be on the wane. Instead, society's environmental future – from risk management to entrepreneurial opportunities – is now firmly on the agenda.'

Further information at www.eci.ox.ac.uk